

New chilling method cuts cost and saves energy

A new refrigeration technology that promises to both halve carbon emissions and cut energy bills by more than 30 per cent could help food manufacturers now striving to meet regulations on greenhouse gas reductions and control rising costs.

Researchers claim they have adapted the combined heat and power technique, which allows companies to produce electricity and heat on-site from small gas-turbine generators, to include refrigeration. Using the new combined heat, power and refrigeration system (CHRP), food companies would be able to feed waste heat produced by the generators into an absorption chiller, which could then provide the necessary temperatures for frozen and chilled foods.

Researchers described initial feasibility tests as “very encouraging”, and said they expected the project, which is still in its early stages at Britain’s Brunel University in Middlesex, to achieve a 50 per cent reduction in energy usage within two years.

The project team said this provided companies with considerable scope to drive down costs and added that CHRP also had the potential to compete on price with carbon, the raw material commonly used in energy production.

The ‘green’ nature of CHRP could also be crucial for food processors and retailers who together consume 15 per cent of the national energy supply in Britain and now face stern governmental and international pressure to reduce greenhouse gas emissions. EU member states and the Commission have agreed to introduce regulations to reduce emissions of fluorinated gases, used widely in industrial refrigeration, as part of their implementation of the Kyoto treaty on climate change.

These gases, including hydro fluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆), only account for two per cent of EU carbon emissions yet are thought to have a global warming potential almost 24,000 times stronger than carbon dioxide.

The researchers at Brunel, jointly funded by the government and a food industry consortium including supermarket Safeway, believe three to five micro-turbines could use CHRP to deliver all the refrigeration needed at a typical large supermarket. And the technology could be applied across the whole food industry such as in cold stores, food-freezing factories and freeze-drying plants.

CHRP is still some way behind, yet a report on the current UK project says a system could be launched commercially by 2007 once the technology has been properly developed and patented.

A special type of absorption chiller is currently under development at Brunel and the project team will spend the next few months focusing on the design of this and also associated heat exchangers. They will then transform part of the university into a mini-supermarket to test the complete system using micro-turbines.

Source: Food Production Daily